Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of the claims in the application:

Listing of claims:

1. (Previously Presented) A method of fabricating a semiconductor device comprising:

selecting a starting semiconductor substrate having a first defect density and a first doping level;

forming a semiconductor layer on said starting semiconductor substrate to have a second defect density that is equal to or less than the first defect density, the semiconductor layer being doped during formation to have a second doping level that is less than the first doping level at a first surface closest to the starting semiconductor substrate;

forming active components on a second surface of said semiconductor layer, opposite to the first surface; and

removing said starting semiconductor substrate.

2. (Previously Presented) The method of claim 1 further comprising:

controlling a doping level for said semiconductor layer during formation.

3. (Previously Presented) The method of claim 2 wherein the doping level is controlled to uniformly dope the semiconductor layer at the second doping level.

4. (Original) The method of claim 1 wherein said starting semiconductor substrate and said semiconductor layer are made from GaAs.

5. (Previously Presented) The method of claim 1 wherein said starting semiconductor substrate is made from GaAs and said semiconductor layer is made from epitaxial growth of a single crystal material.

6. (Original) The method of claim 5 wherein said semiconductor layer is made from AlGaAsP.

7. (Original) The method of claim 1 wherein said starting semiconductor substrate has a low defect density.

8. (Previously Presented) The method of claim 7 further comprising:

controlling a doping level for said semiconductor layer during formation.

9. (Previously Presented) The method of claim 8 wherein the semiconductor layer is uniformly doped at the second doping level.

10. (Original) The method of claim 7 wherein said starting semiconductor substrate and said semiconductor layer are made from GaAs.

11. (Previously Presented) The method of claim 7 wherein said starting semiconductor substrate is made from GaAs and said semiconductor layer is made from epitaxial growth of a single crystal material.

12. (Original) The method of claim 11 wherein said semiconductor layer is made from AlGaAsP.

13. (Previously Presented) The method of claim 1 wherein said forming active components includes forming an optical gain cavity on the second surface of said semiconductor layer, the optical gain cavity arranged to emit light through the semiconductor layer.

14. (Previously Presented) The method of claim 13 further comprising:

controlling a doping level for said semiconductor layer during formation.

15. (Previously Presented) The method of claim 14 wherein the doping level is controlled to uniformly dope the semiconductor layer at the second doping level.

16. (Original) The method of claim 13 wherein said starting semiconductor substrate and said semiconductor layer are made from GaAs.

17. (Previously Presented) The method of claim 13 wherein said starting semiconductor substrate is made from GaAs and said semiconductor layer is made from epitaxial growth of a single crystal material.

18. (Original) The method of claim 17 wherein said semiconductor layer is made from AlGaAsP.

19-24. (Cancelled)

25. (Previously Presented) The method of claim 13, further comprising:

forming an optical aperture on the first surface of said semiconductor layer after removing said starting semiconductor substrate; and

disposing an external mirror/lens relative to the first surface of said semiconductor layer to create an extended optical cavity.

26. (Previously Presented) The method of claim 25 further comprising:

controlling a doping level for said semiconductor layer during formation.

27. (Previously Presented) The method of claim 26 wherein the semiconductor layer is uniformly doped at the second doping level.

28. (Original) The method of claim 25 wherein said starting semiconductor substrate and said semiconductor layer are made from GaAs.

29. (Original) The method of claim 25 wherein said starting semiconductor substrate is made from GaAs and said semiconductor layer is are made from epitaxial growth of a single crystal material.

30. (Original) The method of claim 29 wherein said semiconductor layer is made from AlGaAsP.

31. (Previously Presented) The method of claim 27 wherein the second doping level is between 5 x 10^{16} cm^{-3} and 5 x 10^{17} cm^{-3}.

32. (Currently Amended) The method of claim 26 wherein the doping level is controlled to dope a majority of the thickness of said semiconductor layer at the second doping level, and dope a [[a]] region of said semiconductor layer adjacent to the second surface at a third, higher doping level.

33-38. (Cancelled).

39. (Previously Presented) The method of claim 1 further comprising:

forming an etch-stop layer on the starting semiconductor substrate prior to forming the semiconductor layer, wherein the etch-stop layer is composed of a different material than the starting semiconductor substrate and the semiconductor layer.

40. (Previously Presented) The method of claim 39 further comprising:

removing the etch-stop layer after removing the starting semiconductor substrate.

41. (Previously Presented) The method of claim 1 further comprising:

forming a first electrical contact over the active components; and

forming a second electrical contact to electrically contact the second surface of the semiconductor substrate, the first and second electrical contacts being formed on a same side of the semiconductor layer.

42. (Previously Presented) The method of claim 41 further comprising:

controlling a doping level for said semiconductor layer during formation, the doping level being controlled to uniformly dope the semiconductor layer at the second doping level.

43. (Previously Presented) The method of claim 41 further comprising:

controlling a doping level for said semiconductor layer during formation, the doping level being controlled to dope a majority of the thickness of said semiconductor layer at the second doping level and dope a region of said semiconductor layer adjacent to the second surface at a third, higher doping level.

44. (Previously Presented) The method of claim 2 wherein the doping level is controlled to dope a majority of the thickness of said semiconductor layer at the second doping level and dope a region of said semiconductor layer adjacent to the second surface at a third, higher doping level.

45. (Previously Presented) The method of claim 13 wherein said forming active components further includes:

forming a first electrical contact on the optical gain cavity; and

forming a second electrical contact to electrically contact the second surface of the semiconductor substrate, the first and second electrical contacts being formed on a same side of the semiconductor layer.

46. (Previously Presented) The method of claim 45 further comprising:

controlling a doping level for said semiconductor layer during formation, the doping level being controlled to dope a majority of the thickness of said semiconductor layer at the second doping level and dope a region of said semiconductor layer adjacent to the second surface at a third, higher doping level.

47. (Previously Presented) The method of claim 13 further comprising:

controlling a doping level for said semiconductor layer during formation, the doping level being controlled to dope a majority of the thickness of said semiconductor layer at the second doping level and dope a region of said semiconductor layer adjacent to the second surface at a third, higher doping level.

48. (Previously Presented) The method of claim 25 further comprising:

forming an anti-reflecting layer on the first surface of said semiconductor layer after removing said starting semiconductor substrate, the optical aperture to be formed on the anti-reflecting layer.